

NEW AUSTRALIAN FISHES. PART 2.
FOUR NEW SPECIES OF APOGONIDAE

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Abstract

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Four species of apogonid fishes are described from Australian seas: *A. pallidofasciatus* (northern Western Australia), *Rhabdamia eremia* (northern Australia and widespread in the Indo-West Pacific), *Vincentia badia* (South Australia and southern Western Australia), and *V. macrocauda* (South Australia and southern Western Australia).

Introduction

The perciform family Apogonidae or cardinal fishes contains approximately 200 species in 26 genera. Most members are found on or in the vicinity of coral reefs, although the Australian genus *Vincentia* is confined to temperate waters. The family remains poorly studied and is in need of revision at the generic level. Approximately 100 species occur in Australian seas. The present paper describes four new species belonging to the genera *Apogon*, *Rhabdamia* and *Vincentia* as defined by Fraser (1972). Placement in these groups was based on both external features and examination of osteological characters facilitated by cleared and stained specimens and radiographs.

Type specimens are deposited at the Australian Museum, Sydney (AMS), Bernice P. Bishop Museum, Honolulu (BPBM), Museum of Victoria, Melbourne (NMV), South Australian Museum, Adelaide (SAM), and Western Australian Museum, Perth (WAM). In the following descriptions the range of counts and proportions for paratypes are indicated in parentheses if different from the holotype. The designation "½" appearing in fin-ray counts refers to the last ray when it is joined to the base of the penultimate ray.

Apogon pallidofasciatus sp. nov.

Figure 1

Material examined. Holotype. Western Australia, Tantabiddi



Figure 1. *Apogon pallidofasciatus*, holotype (WAM P2898 5-001), 100.3 mm SL, North West Cape, Western Australia.

Creek (21°54'S, 114°00'E), North West Cape, 3-4 m, spear, G. Allen, 21 May 1976, WAM P28985-001 (100.3 mm SL).

Paratypes. Western Australia, collected with holotype, AMS 1.26316-001 (71.5 mm SL); Rosemary Island (20°29'S, 116°35'E), Dampier Archipelago, 1-5 m, rotenone, G. Allen, 8 Nov 1974, WAM P25114-004 (79.0 mm SL); Lady Nora Island (20°27'S, 116°37'E), Dampier Archipelago, 3 m, rotenone, G. Allen and R. Steene, 16 Nov 1974, WAM P25117-009 (86.0 mm SL); Port Hedland (20°18'S, 118°35'E), A. Kalnins, 15 Jun 1965, BPBM 30940 (4: 60.5-78.5 mm SL) and 1-2 m, rotenone, N. Sarti and R. Kelly, 18 Jan 1981, WAM P27274-046 (5: 73.7-80.0 mm SL).

Description. A striped species of apogonid belonging to the *Apogon cooki* "complex" and distinguished by the following combination of characters: dorsal rays VII-I, 9½; anal rays II, 8½; pectoral rays 14 (occasionally 15); lateral-line scales 24 plus 4 additional scales on caudal fin base; gill rakers on first arch including rudiments

5 + 14 = 19 (5 or 6 + 14 or 15 = 19-21); greatest body depth 2.5 (2.5-2.7), head length 2.7 (2.5-2.7), both in standard length; snout length 4.5 (4.3-4.6), eye diameter 3.0 (2.6-2.9), interorbital width 4.6 (4.4-4.9), least depth of caudal peduncle 1.9 (1.9-2.3), length of caudal peduncle 1.4 (1.2-1.5), of pectoral fin 1.5 (1.3-1.5), of pelvic fin 1.7 (1.3-1.7), maximum height of second dorsal fin 1.4 (1.4-1.7), of anal fin 1.9 (1.8-2.0), all in head length.

Colour in life: overall reddish-brown with very faint, nearly indistinguishable pattern of 4 to 6 dark stripes on sides, these stripes more evident in smaller specimens; a rounded spot, about pupil size, at base of caudal fin, more pronounced in specimens under about 60 mm SL; a silvery or whitish stripe from snout to eye and continued behind eye to rear of operculum; fins dusky brown to reddish; base and axil of pectoral fin may be dusky brown, but not significantly darker than surrounding area.

Colour in alcohol: overall brown including fins except pectorals only slightly dusky; darker stripes on side faintly visible; a roundish spot, about pupil size, faintly visible on caudal fin base. Gut brownish, this coloration due to dense network of melanophores; peritoneum pale with widely scattered black spots.

Distribution. Known thus far only from Western Australia between North West Cape and Broome.

Etymology. From the Latin *pallidus* (pale) and *fasciatus* (stripe), referring to the characteristic dull stripes compared to other members of the *A. victoriae* "complex".

Remarks. *Apogon pallidofasciatus* belongs to a complex of four closely related species that occur in Australian coastal habitats, exclusive of offshore reef areas such as the Great Barrier Reef. Other members of this group include *A. victoriae* Günther of south-western Australia and an undescribed species from New South Wales and southern Queensland. The other member, *A. cooki* Macleay is wide ranging in the Indo-West Pacific region. Diagnostic features of these species are contrasted in Table 1. *A. pallidofasciatus* is sympatric only with *A. cooki* from which it differs by having a larger eye, a larger maximum size, usually 14 rather than 15 pectoral rays, 19-21 (usually 20) rather than 16-19 gill rakers on

the first gill arch and in having the dark body stripes absent or faint in adults.

Apogon pallidofasciatus occurs on shallow (about 2-8 m) reefs, usually close to shore, where there is moderate turbidity.

Rhabdamia eremia sp. nov.

Figure 2

Rhabdamia species Allen, 1985: 2327, Fig. 172.

Material examined. Holotype. Western Australia, South Murion Island (21°42'S, 114° 20'E), 8 m, rotenone, B. Hutchins and J. Tryndall, 7 Jun 1977, WAM P25815-020 (37.5 mm SL).

Paratypes. Western Australia. Collected with holotype, AMS 1.26320-001 (22.0 mm SL). Beacon Island (28°29'S, 113°47'E), Abrolhos Group, 3-10 m, rotenone, G. Allen, 9 Apr 1978, WAM P26071-013 (26.1 mm SL) and 25-30 m, rotenone, G. Allen and N. Sinclair, 13 Apr 1982, WAM P27581-001 (39.6 mm SL). Clerke Reef (17°16'S, 119°22'E), Rowley Shoals, 35-40 m, rotenone, G. Allen and R. Steene, 6 Aug 1983, WAM P28024-009 (22.0 mm SL).

Queensland, Escape Reef (15°50'S, 145°50'E), 2-8 m, rotenone, J. Paxton et al., 27 Oct 1981, WAM P27459-006 (30.4 mm SL).

Indian Ocean, Christmas Island (10°28'S, 105°24'E), 15-20 m, rotenone, G. Allen and R. Steene, 20 May 1978, WAM P26085-015 (25.5 mm SL) and 14 m, rotenone, G. Allen and R. Steene, 25 May 1978, WAM P26092-023 (2: 20.0- 21.0 mm SL).

Red Sea, near Jeddah (21°28'N, 039°08'E), Saudi Arabia, WAM P25793-003 (6: 25.0-31.0 mm SL).

Description. A small, semi-transparent species of *Rhabdamia* distinguished by the following combination of characters: dorsal rays VI-1, 9½ (rarely 10½); anal rays II, 13½ (12½ or 13½); pectoral rays 10; gill rakers on first arch 1+12=13 (1+11 or 12=12 or 13) plus 1-2 low rudiments on upper limb; lateral-line scales missing from all specimens, but judging from "scale pockets" probably about 24; greatest body depth 4.0 (3.64.0), head length 2.7 (2.5-2.9), both in standard length; snout length 4.2 (3.4-4.8), eye diameter 3.3 (3.0-4.1), interorbital width 4.0 (3.8-4.6), least depth of caudal peduncle 3.3 (3.3-3.5), length of caudal peduncle 1.5 (1.3-1.5), of pectoral fin 1.5 (1.4-1.5), of pelvic fin 2.0 (1.9-2.4), maximum height of second dorsal fin 2.0 (1.8-2.1), of anal fin 1.8 (1.8-2.6), all in head length.

Colour in life: head with light brown or reddish pigmentation on snout and cheek, operculum silvery; body semi-transparent with silvery abdominal region; fins clear.

Table 1. Comparison of diagnostic features for species in the "Apogon cooki complex"

	<i>A. cooki</i> (Australian specimens)	<i>A. victoriae</i>	<i>A. pallidofasciatus</i>	<i>Apogon</i> sp. (N.S.W.-Queensland)
total gill rakers first arch	15-18, occasionally 19	19-20	19-21	19-21
pectoral fin rays	15	14	14	14
eye in head length	3.0-3.3	3.0-3.4	2.6-3.0	3.0-3.2
approximate maximum SL (mm)	90, usually 70	115	110	110
stripe pattern	distinct	distinct	faint or absent (but evident in young)	distinct
width of dark stripes in relation to pale interspaces	wider or equal	wider or equal	wider or equal (if visible)	much narrower
postocular (3rd stripe)	present	present	present or absent	absent
black spot covering pectoral fin base and axil	poorly developed	present	absent	absent



Figure 2. *Rhabdamia eremia*, holotype (WAM P25815-002), 37.5 mm SL, South Murion Island, Western Australia.

Colour in life: head with light brown or reddish pigmentation on snout and cheek, operculum silvery; body semi-transparent with silvery abdominal region; fins clear.

Colour in alcohol: overall whitish or yellow-tan without pigmentation. Gut whitish; peritoneum with dense network of melanophores.

Distribution. Apparently widespread in the Indo-West Pacific. Thus far known from the southern Red Sea, Christmas Island (Indian Ocean), Western Australia and Queensland.

Etymology. From the Greek *eremos* (solitary), referring to its dwelling habit in contrast to *Rhabdamia cypselurus* and *R. gracilis* which occur in aggregations.

Remarks. *Rhabdamia eremia* co-occurs with *R. gracilis* and *R. cypselurus* at many localities, but unlike these species which form large diurnal aggregations around coral formations, it is mainly solitary and cryptic. It is usually seen only if flushed from coral reef crevices with rotenone at depths between about 10 and 40 m.

A diagnosis of the genus *Rhabdamia* Weber was provided by Fraser, 1972. The four members of this group are distinguished by the following key.

Key to species of *Rhabdamia*

1. Seven spines in first dorsal fin; scales ctenoid (Red Sea) *R. nigrimentum* (Smith)
- Six spines in first dorsal fin; scales cycloid 2
2. Anal fin rays II, 9½ (widespread Indo-West Pacific) *R. cypselurus* Weber
- Anal fin rays II, 12½-13½ 3
3. Gill rakers on lower limb of first arch 20-22 (widespread Indo-West Pacific) *R. gracilis* Weber
- Gill rakers on lower limb of first arch II-12 (widespread Indo-West Pacific) *R. eremia* sp. nov.

Vincentia badia sp. nov.

Figure 3

Vincentia new species Allen, 1985: 2332, Fig. 183.

Material examined. Holotype. Western Australia, Port Peron (32°16'S, 115°36'E), 1 m, rotenone, N. Sarti, 29 Jan 1978, WAM P25999-006 (68.3 mm SL).

Paratypes. Western Australia. Port Denison (29°16'S, 115°55'E), 7-8 m, rotenone, N. Sinclair, 13 Apr 1983, WAM P27956-009 (2: 39.1-40.0 mm SL). Rottnest Island (32°01'S, 115°27'E), 11 m, rotenone, B. Hutchins, 11 Apr 1978, WAM P26060-006 (43.0 mm SL). Garden Island (32°12'S, 115°40'E), 5 m, rotenone, G. Allen, 10 Sep 1976, WAM P28967-001 (39.2 mm SL). Geographe Bay (33°32'S, 115°02'E), 15 m, rotenone, G. Allen and J. Moyer, 27 Dec 1978, WAM P26532-007 (57.7 mm SL) and 5 m, rotenone, B. Hutchins, 30 Jun 1982, WAM P27643-009 (2: 47.1-61.2 mm SL).

South Australia. Near Riley Point (33°53'S, 137°37'E), rote-

none, D. Hoese, W. Ivantsoff and D. Brown, 25 Dec 1973, AMS 1.17614-004 (16: 16.3-40.1 mm SL). Cape Jervis (35°36'S, 138°06'E), R. Kuitert, 9 Mar 1984, NVM A3729 (35.5 mm SL).

Description. A relatively small, dusky brown apogonid distinguished by the following combination of characters: dorsal rays VIII-I, 9½ (rarely VII-I, 9½); anal rays II, 9½; pectoral rays 15; gill rakers on first arch 1+7 (1+6 or 7) plus 3-5 low rudimentary rakers on each limb; lateral-line scales 23 (occasionally 24) plus 1-2 additional scales at base of caudal fin; greatest body depth 2.3 (2.3-2.6), head length 2.5 (2.4-2.6), both in SL; snout length 5.3 (4.4-5.9), eye diameter 3.1 (2.6-3.2), interorbital width 3.7 (3.4-4.1); least depth of caudal peduncle 2.5 (2.4-3.2), length of caudal peduncle 1.6 (1.4-1.7), of pectoral fin 1.5



Figure 3. *Vincentia badia*, paratype (WAM P27643-009), 47.1 mm SL, Geographe Bay, Western Australia (B. Hutchins photo).

(1.6-1.7), of pelvic fin 1.3 (1.1-1.5), maximum height of second dorsal fin 1.7 (1.7-1.9), of anal fin 1.9 (1.8-2.1), all in head length.

Colour in life: overall reddish-brown, including fins, although pectorals somewhat lighter and translucent areas sometimes present on caudal membranes and on basal half of anal fin. Occasional specimens are primarily red.

Colour in alcohol: variable, ranging from overall yellow-tan with whitish or translucent fins to dusky brown, with centre of scales often light brown or tan and with all fins dusky brown except pectorals pale tan. Gut mainly whitish with scattering of melanophores; peritoneum with dense network of melanophores.

Distribution. Coast of southern Australia between Spencer Gulf, South Australia (33°53'S, 137°37'E) and Port Denison, Western Australia (29°16'S, 114°55'E).

Etymology. From the Latin *badius* (red-brown), referring to the characteristic coloration.

Remarks. This species is allied to *Vincentia conspersa* (Klunzinger) from south-eastern Australia (including Tasmania). It differs primarily by having fewer lateral-line scales (23 or 24 compared with 25 or 26 for *V. conspersa*; this count excludes 1-2 scales extending onto the caudal fin base), and a smaller size (under 70 mm SL, usually less than 55 mm SL, compared to about 115 mm SL for *V. conspersa*). The depth range of *V. badia* extends from 1 to at least 44 m. It generally occurs in rocky areas.

Vincentia macrocauda sp. nov.

Figure 4

Material examined. Holotype. Western Australia, Cheyne Beach (34°53'S, 118°25'E), rotenone, B. Hutchins, 19 Apr 1980, WAM P26608-017 (70.3 mm SL).

Paratypes. Western Australia. Lucky Bay (34°08'S, 122°15'E), 24 m, rotenone, B. Hutchins, 15 Apr 1984, SAM F.5471 (71.2 mm AL) and WAM P28298-010 (84.0 mm SL); 5-7 m, rotenone, B. Hutchins, 12 Apr 1984, WAM P28293-023 (52.5 mm SL); 8-10 m, B. Hutchins, 14 Apr 1984, WAM P28297-015 (2: 40.2-43.5 mm SL). Between Sandy Hook Island and Cape LeGrand (34°02'S, 122°03'E), A. Longbottom, 23 Jan 1986, WAM P28864-005 (62.0 mm SL).

South Australia, Troubridge Island (35°07'S, 137°49'E), J. Glover, 2 Feb 1969, SAM F.3916 (51.7 mm SL).

Description. Medium-sized apogonid with extremely elongate caudal peduncle and spotted fins distinguished by the following combination of characters: dorsal rays VII-I, 9½; anal rays II, 8 (II, 9½); pectoral rays 14 (14 or 15); gill rakers on first arch 5+12=17 (3-5+12-13=15-18), lateral-line scales 25 plus 2 additional scales at base of caudal fin; greatest body depth 3.1 (3.1-3.5), head length 2.8 (2.8-2.9), both in SL; snout length 4.1 (4.2-4.8), eye diameter 2.8 (2.6-2.9), interorbital width 3.3 (3.4-4.0), least depth of caudal peduncle 2.4 (2.3-2.6), length of caudal peduncle 1.2 (1.1-1.3), of pectoral fin 1.6 (1.51.7), of pelvic fin 1.2 (1.1-1.3), maximum height of second dorsal fin 1.3 (1.2-1.3), of anal fin 1.5 (1.5-1.7); most of scales cycloid, but a few scales on head and side of body with weak ctenii; predorsal scales absent.

Colour in life: overall reddish with bronze hue; pectoral fins clear; first dorsal fin blackish distally with basal part dusky brown, sometimes with faint whitish spots; other fins dusky brown with pupil-sized translucent to faintly yellow spots.



Figure 4. *Vincentia macrocauda*, paratype (SAM F.5471), 70.3 mm SL, Lucky Bay, Western Australia (B. Hutchins photo).

Colour in alcohol: head and body mainly pale yellowish tan; outer edge of first dorsal fin black, remainder of fin pale to dusky brown; other fins dusky brown with large white spots, except pectoral fins plain whitish. Gut darkly pigmented; peritoneum whitish with widely scattered melanophores.

Distribution. Coast of south-western Australia between Troubridge Island, South Australia to Cheyne Beach near Albany, Western Australia.

Etymology. From the Greek *makros* (long) and Latin *cauda* (tail), referring to the elongate caudal peduncle.

Remarks. This is a distinctive species that does not appear to have close affinities with other apogonids. The very long caudal peduncle (1.1-1.3 in head length) and the presence of mainly cycloid scales are distinctive features that differentiate it from other *Vincentia*. The placement of

this species in *Vincentia* is provisional. Preliminary results of a current study of southern Australian apogonids by Allen and Paxton indicate that *Vincentia* may possibly merit only sub-generic distinction within the genus *Apogon*.

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